COMPARATIVE ANALYSIS OF LUMBAR STABILISATION EXERCISES VERSUS GENERAL SPINAL EXERCISES IN THE REHABILITATION OF LUMBAR DISC PROLAPSE

A dissertation submitted in partial fulfillment of the requirement for the degree of

MASTER OF PHYSIOTHERAPY

(ELECTIVE – PHYSIOTHERAPY IN ORTHOPAEDICS)

To

The Tamil Nadu Dr. M.G.R. Medical University

Chennai-600032

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RVS COLLEGE OF PHYSIOTHERAPY

(Affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai – 32)

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CERTIFICATE

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Date:

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INTERNAL EXAMINER: **EXTERNAL EXAMINER:**

SUBMITTED IN THE PARTIAL FULFILLMENT OF THE REQUIREMENT

FOR DEGREE OF "MASTER OF PHYSIOTHERAPY"

TO

THE TAMIL NADU

DR. M.G.R. MEDICAL UNIVERSITY,

CHENNAI.

APRIL 2012

DECLARATION

I hereby declare and present my project work entitled "**COMPARATIVE ANALYSIS OF LUMBAR STABILISATION EXERCISES VERSUS GENERAL SPINAL EXERCISES IN THE REHABILITATION OF LUMBAR DISC PROLAPSE."** The outcome of the original research work undertaken and carried out by me, under the guidance of Professor Mrs.Mahalakshmi, MPT, RVS College of Physiotherapy**,** Sulur, Coimbatore.

I also declare that the material of this project work has not formed in any way the basis for the award of any other degree previously from the Tamil Nadu Dr. M.G.R Medical University.

Date : SIGNATURE

Place :

ACKNOWLEDGEMENT

I magnify the LORD MY GOD, I will give thanks with my whole heart will tell of your wonderful deeds now and forever.

I humbly acknowledge all the love and care showered by the parents Mr.Sasidharan Nair and Mrs. Ushakumari throughout my life in making me what I am.

My heartfelt thanks to The Chairman, Managing Trustee and the Secretary of RVS Educational Trust, Sulur, Coimbatore, for providing me an opportunity to do this dissertation.

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I cover my heartfelt thanks to my guide Mrs.Mahalakshmi, MPT, for this diligent effort to ensure the best quality of this piece of work. Her assertiveness and faith in my abilities as sustained my energies to complete this work successfully.

It is difficult to envision completing a project such as this without the help of many people I owe great deal of thanks to the many that made this reality by extending their helpful hands.

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I. INTRODUCTION

Disc prolapse is a medical condition affecting the spine due to trauma, lifting injuries or idiopathic, fibrous ring (annulus fibrosus) of an inter vertebral disc that allows the soft central portion (nucleus pulposus) to bulge out beyond the damaged outer rings. Tears are almost always posteriolateral in nature owing to the presence of the posterior longitudinal ligament in the spinal canal. The intensity may range from mild to severe and may fluctuate. The pain may radiate into one or both buttocks or even into the whole lower limb.

The pain may begin suddenly or develop gradually. At least 80 % individuals experience a significant episode of low back pain at some point at their lives. At any given point in time, at least 15% of individual's report that they are experiencing disc prolapse. Some consider the symptom of low Back pain to be a part of the human experience.

A prolapsed disc is a problem where the inter-vertebral disc is forced out of the annulus fibrosus, the outer covering of the disc due to mechanical forces increasing intra discal pressure. The incidence of this problem has been rising steadily and, today, every three out of five human beings have had an episode of slipped disc.

Functional anatomy

The vertebral body serves weight-bearing purposes and is well designed for this. The internal structure is also suited to this. The interior is

not solid bone but a cavity with strut in various directions. All spinal muscles are attached to the vertebrae. Thus, movements of muscles determine the strain on the vertebral bodies.

Distension of the annulus produces pain. The outer parts of the annulus are rich in nerves. If the inner pulp tracks from within to the peripheral parts of the disc, stretching of the annulus produces pain. The disc usually prolapses backward and to the side, left or right. The endplates, if injured, cause aberrant distribution of weight and other stresses of movement, over stressing other areas of the lumbar spine. Associated degenerative changes in the spine, pressing on the nerve roots, affect mechanical properties.

If the chemical contents of the disc leak out and touch the nerve roots, this can cause chemical irritation of the nerve roots. Edema of the nerves produces pain.

The pressure of the prolapsed disc can compress adjacent veins and produce congestion. The nerves are particularly susceptible to venous congestion

The patient experiences severe, quite incapacitating pain in the lower back and in the thigh, calf or foot. The patient may not be able to move the affected leg at all due to nerve compression and muscle spasm. Specific movements of the body, like trying to stretch the big toe upwards may be affected. This means that the nerve supplying the muscle is compressed by the disc material. The pain in the lower back is due to spasm of the lumbar muscles with concurrent inflammation and also due to tears of the annulus and supporting ligaments of the inter-vertebral joints. Edema and other

factors mentioned above also cause pain. The pain in the lower limb is known as `referred pain'. As the sciatic nerve innervates the lower limb and its root at the spinal level is irritated by the disc, the current of pain travels to the muscles innervated by that nerve and may be felt at any part of the limb. The point inside the buttock from where the sciatic nerve emerges is a tightly constricted area. The patient may have a tilted spine, to the left or right. This is to avoid pressure on the spinal nerve on the side of the herniated disc. Hence the tilt is to the opposite side of the pathology.

While sitting or standing, most of us use only one side of the body thus compromising alignment. This produces pressure on the sciatic nerve and pain on the side of the body that is overused. A simple example is that of a motorcyclist using the same leg to kick-start the vehicle. Over years the person invariably experiences pain in the buttock region of that leg.

It is essential that we are all aware of our body movements in everyday activities, identify often repeated movements and use the body evenly, however insignificant the task may appear to be.

Lumbar stabilization

Lumbar stabilization is an active form of exercise used in physical therapy. It is designed to strengthen the muscles to support the spine and helps to prevent disc prolapse. Through a regimen of exercises, and with the initial help of an experienced physical therapist, the patient is trained to find and maintain her/his “neutral spine” position. The back muscles are then exercised to teach the spine how to stay in this position.

This exercise technique relies on proprioception, or the awareness of where ones joints are positioned. Performed on an ongoing basis, these exercises can help keep the back strong and well positioned.

Lumbar stabilization is a multi-component program and involves education/training, strength, flexibility and endurance. It is generally used during all phases of a back pain episode and may be prescribed after a thorough evaluation of the patient's specific condition.

Lumbar stabilization exercise is a modern concept in the management of patient with lumbar disc prolapse. Lumbar stabilization exercise is a program of back muscles exercises designed to improve strength and enhance flexibility in a pain free range.

The goals of lumbar stabilization exercises include:

- Reduction of back pain
- Gain control over the movements of the spine during daily activity
- Gain control over the movements of forces acting on the daily activity of the spine
- Heal soft-tissue injury, such as muscle strain and torn ligaments
- Reduce the chance of back injury due to repetitive motions or sudden movements or stresses

1.1. Statement of problem

In the present study the researcher seeks to find out the comparative analysis of lumbar stabilization exercises versus general spinal exercises in the rehabilitation of disc prolapsed.

1.2 Need for the study

The most common work related injury in India every year is low back pain. At least 40 % of individuals experience a significant episode of disc prolapsed at some point in their lives. Hence this study was conducted to find out the optimal treatment strategy for lumbar disc prolapse.

1.3 Hypothesis

Null Hypothesis

There is no significant difference in pain and range of motion of spine between lumbar stabilization exercises and general spinal exercises among prolapsed lumbar disc patients.

Alternative hypothesis

There is significant difference in pain and range of motion of spine between lumbar stabilization exercises and general spinal exercises among prolapsed lumbar disc patients.

1.4. OPERATIONAL DEFINITIONS

Pain:

It is an unpleasant sensory or emotional experience which is usually associated with or described in terms of tissue damage or both. Pain acts as a warning signal that an injury is immediately impending such as touching a hot object.

Lumbar stabilization exercises

Lumbar stabilization is an active form of exercise used in physical therapy. It is designed to strengthen muscles to support the spine and helps to prevent disc prolapse. Through a regimen of exercises, and with the initial help of an experienced physical therapist, the patient is trained to find and maintain her/his “neutral spine” position. The back muscles are then exercised to teach the spine how to stay in this position

Disc prolapsed

Disc prolapse is a medical condition affecting the spine due to trauma, lifting injuries or idiopathic, fibrous ring (annulus fibrosus) of an inter vertebral disc allows the soft central portion (nucleus pulposus) to bulge out beyond the damaged outer rings. Tears are almost always posteriolateral in nature owing to the presence of the posterior longitudinal ligament in the spinal canal. The intensity may range from mild to severe and may fluctuate. The pain may radiate into one or both buttocks or even into the whole lower limb.

II. REVIEW OF LITERATURE

Section: A

2.1 Studies on Disc prolapsed

1. Hahne AJ, et al (1985)

Conducted a study to determine the effects of stabilization exercises for lumbar disc prolapsed patients. Eighteen trials involving 1671 participants were included. Individual high-quality trials provided moderate evidence that stabilization exercises are more effective than no treatment, that manipulation is more effective than sham manipulation for people with acute symptoms and an intact anulus,

2. Ferry.S.Jaysontt et al (1995)

Estimating the prevalence of low back pain in about two third of general population.

3. Jeffrey A. Rihn, et al (2011)

At all follow-up intervals, the primary outcome measures were significantly worse in patients who had had symptoms for more than six months prior to treatment, regardless of whether the treatment was operative or nonoperative

.

4. Bernard Karnath M.D (1990)

States that mechanical low back pain causes increases in pain with activity tenderness on palpation, limited range of motion and abnormal posture.

5. Meode.T.W, Dyer.S, Browne.W, Townend.J Frank.A.O (1990)

Low back pain of mechanical origin randomized control trail-showed the effectiveness of chiropractic technique.

6. Biering Sorensen.F (1983)

A prospective study of low back pain in general population occurrence and recurrence. Seal.J Rehab Med 1983

7..Craw ford ,Creed F(1990)

They studies about the life events and psychological disturbances in patients with disc prolapes

8.Fishbain D,Abdel-Moty(1994)

Measuring residual functional capacity in disc prolepses based on the dictionary of occupational title.

Section: B

2.2 Studies on Lumbar stabilization exercises

1. **O. Sullivan peter b(1997)**

Evaluation of specific stabilization exercise in the treatment of chronic low back pain with radiological diagnosis of spondylosis or spondylolisthesis

2. **Koumontakas GA, Watson P J. (2005) In their**

Study stated that the trunk muscle stabilization training plus general exercises verses general exercises only, randomized control trial of patient with recurrent low back pain –what is the result?

3. **Danneels L A (2001)**

that the effects of three different training modalities on the cross sectional area of the lumbar multifidus muscle in patient with chronic low back pain.

4. **Hodges PW and Rechardson CA (1996)**

that the muscular stabilisation of the lumbar spine is effective associated with low back pain

5. **Richardson C Jull G (1999)**

that effects of therapeutic exercises for spinal segmental stabilization in low back pain .

6. **Figen Yilmas ,Funda Merdol(2003)**

Efficacy of dynamic lumbar stabilization exercise in lumbar micro discectomy.

Section: C

2.3 Studies on General spinal exercises

1. **Bartelink (1957)**

Trunk flexion exercises protect the lumbar disc from excessive posteroanterior pressure through the development of intra abdominal pressure.

2. **Pauley (1966)**

Spinal extensors are the main muscle groups in postural holding and in the eccentric control of trunk flexion.

3. **Kapandji (1979)**

Extension exercises promote normal physiologic lumbar curve of the spine allowing it to withstand axial compression force.

4. **Kendall PH , Jenkins HM (1968)**

They studies that the effectiveness of Spinal exercises for backache

5. **.EI Nagar IM ,Nordin M(1991)**

Effects of spinal flexion and extension exercises on low back pain and spinal mobility in chronic mechanical low back pain

Section: D

2.4 Studies on outcome measures

1. **Boonsta, Anne M, Schiphorst Preuper (2008)**

Conducted a study to determine the reliability and validity of visual analogue scale in musculoskeletal pain aged over 18 years. The study population consists of 52 patients in the reliability study and 344 patients in the validity study. The conclusion of the study was that the validity of VAS was moderate to good and its reliability was questionable.

2. **Olaegun, Mathew, Adedoyin, Rufus (2004)**

Conducted a study to determine the intra class and inter-class correlation Rom and schematic differential site patients with low back pain. 25 patients with chronic low back pain patients were selected for the study. Two testers independently rated the pain experienced by the patient. The results suggested that range of motion by inch tape measurement is reliable and valid for clinical rating of low back pain.

III. METHODOLOGY

3.1. Study design:

Study design was pre test and post test Experimental study.

3.2. Study setting

JJ Hospital, Kayamkulam, Kerala.

3.3. Sampling

Based on the following criteria 20 patients who had lumbar disc prolapse for duration of up to 8weeks were selected for the study and they were randomly divided in to two treatment group.

3.4. Inclusion criteria

Clinically Diagnosed as Acute disc prolapse (for up to 8 week duration)

Age between 30 and 40 years

Both males and females

3.5. Exclusion criteria

Chronic disc prolapse (for more than 8 weeks of duration)

Infections such as osteomylitis, TB

Spinal vertebral fracture

Cancer involving the spinal cord

Arthritic condition such as Osteo Arthritic and Rheumatoid arthritis.

3.6. Study duration

Daily once for four weeks.

3.7. Variables of the study

- **Independent variables**

  Lumbar stabilization exercise,

  General spinal exercise.

- **Dependent variables**

  Pain,

  Range of motion (lumbar flexion and extension).

3.8. Measurement tools

Visual analogue scale (VAS),

Inch Tape Measurement.

3.9. Treatment Procedure

Group A receives lumbar stabilization exercise.

Group B receives general spinal exercise.

Procedure:

The study is carried out in 4 steps.

STEP 1: Pre-test for all participants regarding the dependent variables.

STEP 2: Divided the subjects randomly into 2 groups

STEP 3: Treatment interventions.

STEP 4: Post-test all the participants regarding the dependent variable.

Group A

- **Lumbar stabilization exercises**

Lumbar stabilization exercise is a modern concept in the management of patient with lumbar disc prolapse. The multifidi and transverse abdominals and the muscles of the back support and stabilize the spine to help prevent the low back pain. Lumbar stabilization exercise is a program of back muscles exercises designed to improve strength and enhance flexibility in a pain free range.

- **Exercises to strengthen the multifidus and transverse abdominal muscles of the spine.**

The multifidus and transverse abdominal muscles run the length of the spine and they are the important component of spine stability and posture.

Measurement Procedure:

- Visual Analog Scale (VAS)
- Range of motion

Visual Analog Scale :

The VAS is the most commonly known and used for measurement of pain. The scale consists of a straight line of a specified length (100mm) with verbal descriptors at each end. The line may be horizontal or vertical. NO PAIN is on one end of the line and WORST PAIN is on the other end of the line. The subjects are instructed to place a mark on the line to report the intensity of pain experienced at that moment. Scoring is done by measuring the millimeters from the low end of the scale to the subjects mark.

Range of motion

Anatomical landmarks (spinous processes) are identified and marked. A tape measure measurement is made of the distance between the two points. The patient is asked to flex or extend the spine and the new distance between the two points were measured. With flexion, the two points will be further apart, conversely, with extension the two points will approximate. The difference between the first and second measurement is an objective assessment of segmental or regional spine mobility between the initial anatomical landmarks.

Treatment Procedure:

Group A:

Lumbar stabilization exercise

Neutral position progression

Patient Position

Lie on back, left knee bend

Technique

- Tighten abdominals and buttocks, keep in back in neutral position.(Fig: 1)
- Raise right leg 12 inches knee straight (Fig : 2)
- Hold three counts
- Lower leg repeat 10 times
- Repeat with left leg
- Progress to making circles (Fig : 3)
- Progress to making squire

Fig1:

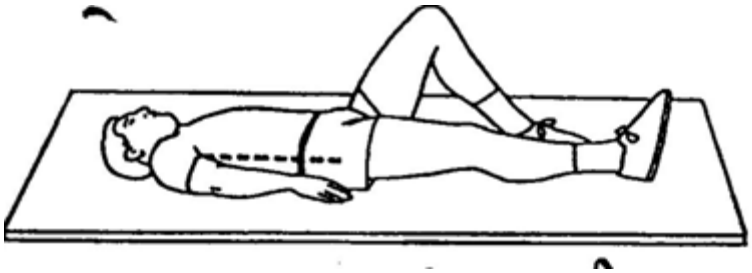


Fig :2

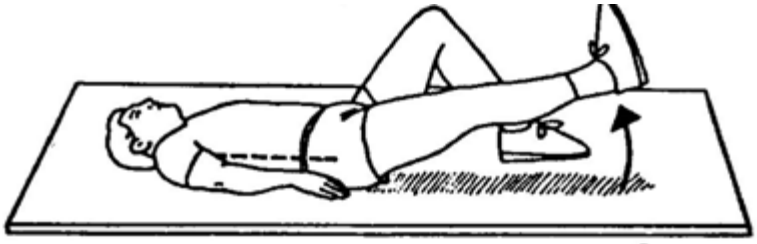


Fig : 3

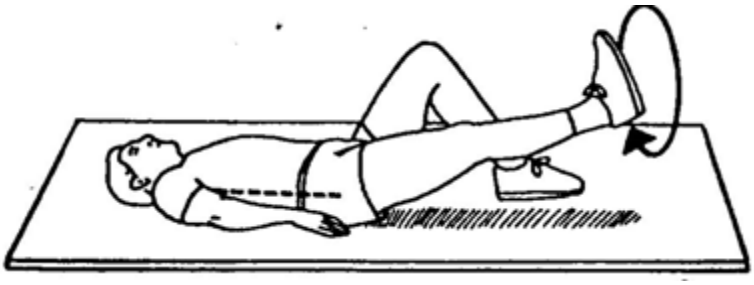
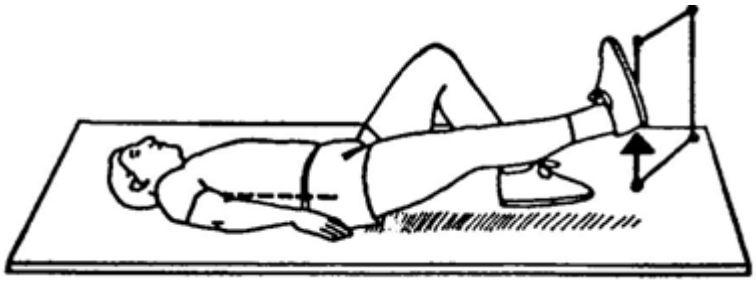


Fig: 4



Kneeling progression

Position

Kneeling position

Technique

- Tighten abdominals and buttocks, keeping back in neutral position (fig: 1)
- Hand on hip position (fig :2)
- Raise right foot and place on floor in front of patient, kneeling on left knee
- Lunge forward, moving at hips (fig :4)
- Hold 3 counts
- Return to kneeling
- Repeat 10 times
- Repeat with opposite side

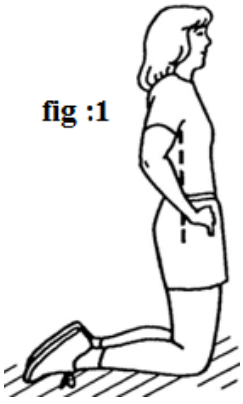


fig :1

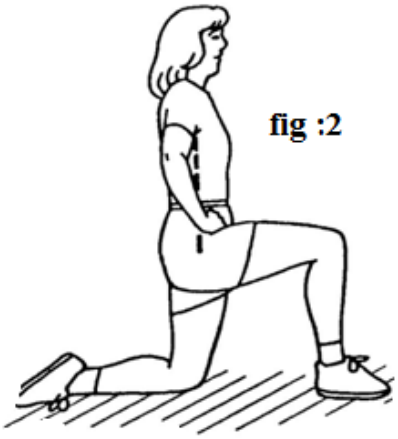


fig :2

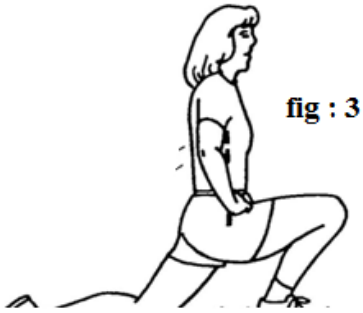


fig : 3

Parameters

Visual analogue scale (VAS)

Range of motion

General spinal exercises (group B)

Technique

- Spinal flexion (forward bending)

Position:

Lie on back

Technique

- Spinal extension exercises (backward bending).

Position

Lie on abdomen

Progress of the patient is measured on the modified visual analogue scale, and range of motion based on the subjective evaluation of the patients in their activities of life.

IV.DATA ANALYSIS AND RESULTS

4.1 Data Analysis

STATISTICAL TOOLS

Paired ‘t’ – test

The intra group analysis of results were done with paired ‘t’ test with 5% level of significance.

Statistical analysis is done by using paired ‘t’ test

$$t = \frac{\bar{d}\sqrt{n}}{s}$$

$$s = \sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n-1}}$$

$\bar{d}$ = difference between the pre-test Vs post test

d = mean difference

n= number of observations

s = standard deviation

To compare Group A and B

Statistical analysis is done by using un paired ‘t’ test

$$t = \frac{\overline{X_1} - \overline{X_2}}{S}\sqrt{\frac{n_1 n_2}{(n_2 + n_2)}}$$

$$S = \sqrt{\frac{\sum d_1^{\,2} + \sum d_2^{\,2}}{n_1 + n_2 - 2}}$$

Where

S = Combined standard deviation

d_1 and d_2 = Difference between initial and final readings in Group A and Group B respectively.

n_1 = No. of patients in Group A

n_2 = No. of patients in Group B

$\overline{X_1}$ *and* $\overline{X_2}$ = Mean of Group A and Group B respectively.

TABLE: 1

Pretest and post test values of pain Group A

Using visual analogue scale

NO OF PATINTS	PRE TEST VALUES	POST TEST VALUES
1	7	3
2	6	4
3	8	6
4	7	3
5	4	0
6	5	0
7	8	5
8	7	2
9	6	1
10	6	0

TABLE: 2

Pre test and post test values of pain Group B

Using visual analogue scale

NO OF PATIENTS	PRE TEST VALUES	POST TEST VALUES
1	8	5
2	4	2
3	5	3
4	4	3
5	2	1
6	5	4
7	6	5
8	8	5
9	4	2
10	1	1

TABLE: 3

Pre Test and Post Test Values of Group A for Flexion

Using Range Of Motion

NO OF PATIENTS	PRE TEST VALUES	POST TEST VALUES
1	4.5	5.0
2	5.0	5.8
3	5.2	6.0
4	3.5	5.0
5	4.2	5.8
6	5.0	5.6
7	3.8	5.2
8	4.2	6.2
9	6.2	6.8
10	5.8	6.0

TABLE: 4

Pre Test and Post Test Values of Group A

For Extension Using Range Of Motion

NO OF PATIENTS	PRE TEST VALUES	POST TEST VALUES
1	5.4	1.2
2	5.6	0.6
3	5.0	0.2
4	5.8	1.2
5	5.5	1.0
6	5.1	0.5
7	5.3	0.5
8	5.2	0.2
9	5.3	0.2
10	5.1	0.4

TABLE: 5

Pre test and post test values of Group B

For flexion using range of motion

NO OF PATIENTS	PRE TEST VALUES	POST TEST VALUES
1	4.5	5.0
2	5.0	5.8
3	5.2	6.0
4	3.5	5.0
5	4.2	5.8
6	5.0	5.6
7	3.8	4.2
8	4.2	4.8
9	3.5	4.1
10	5.0	5.2

TABLE: 6

Pre test and post test value Group B

For extension using range of motion

NO OF PATIENTS	PRE TEST VALUES	POST TEST VALUES
1	4.2	5.4
2	5.0	5.6
3	4.8	5.0
4	4.6	5.8
5	4.5	5.5
6	4.6	4.8
7	4.8	5.2
8	5.0	5.1
9	5.1	5.3
10	4.7	4.8

Table: 7

MEAN AND MEAN DIFFERENCE OF PRE TEST AND POST TEST

S.NO	GROUP A	Improvement		Standard Deviation	Paired 't' value
		Mean	Mean Difference		
	Pretest Posttest	6.4 2.4	4	1.33	9.50

VALUES OF GROUP A (VAS)

Fig: 1

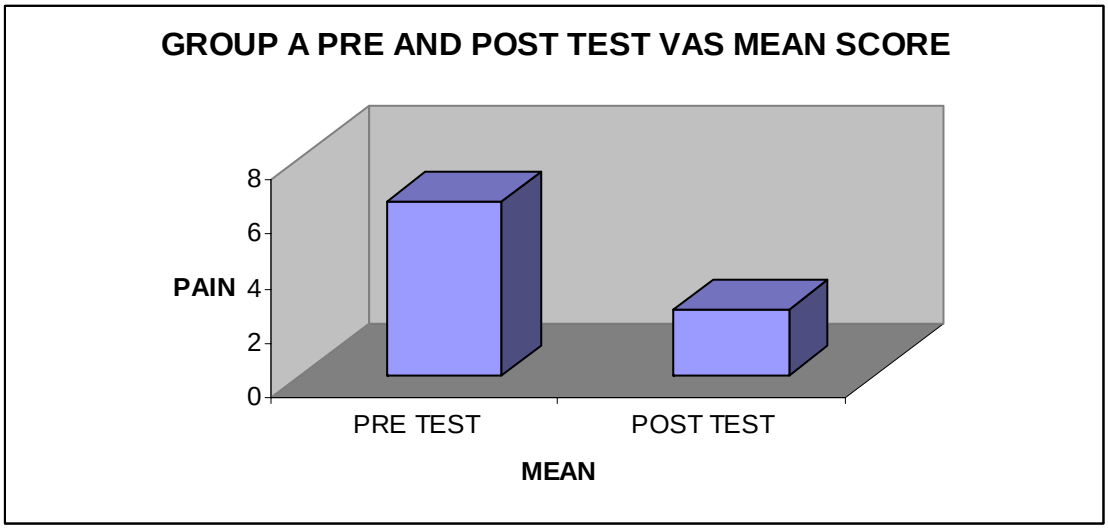


Table: 8

MEAN AND MEAN DIFFERENCE OF PRE TEST AND POST TEST OF GROUP B (VAS)

S.NO	GROUP B	Improvement		Standard Deviation	Paired 't' value
		Mean	Mean Difference		
1.	Pretest	4.7	1.6	1.15	8.24
2.	Posttest	3.1			

Fig:2

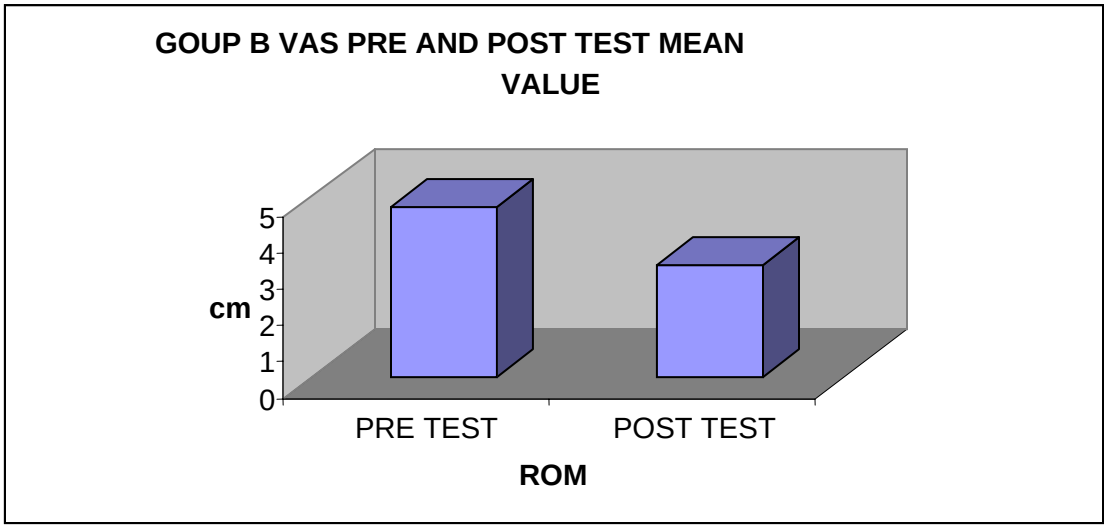


Table: 9

MEAN AND MEAN DIFFERENCE OF PRE TEST AND POST TEST VALUES OF GROUP A FLEXION USING RANGE OF MOTION (ROM)

S.NO	GROUP A	Improvement		Standard Deviation	Paired 't' value
		Mean	Mean Difference		
1.	Pretest	4.74	1	0.94	5.44
2.	Posttest	5.74			

Fig:3

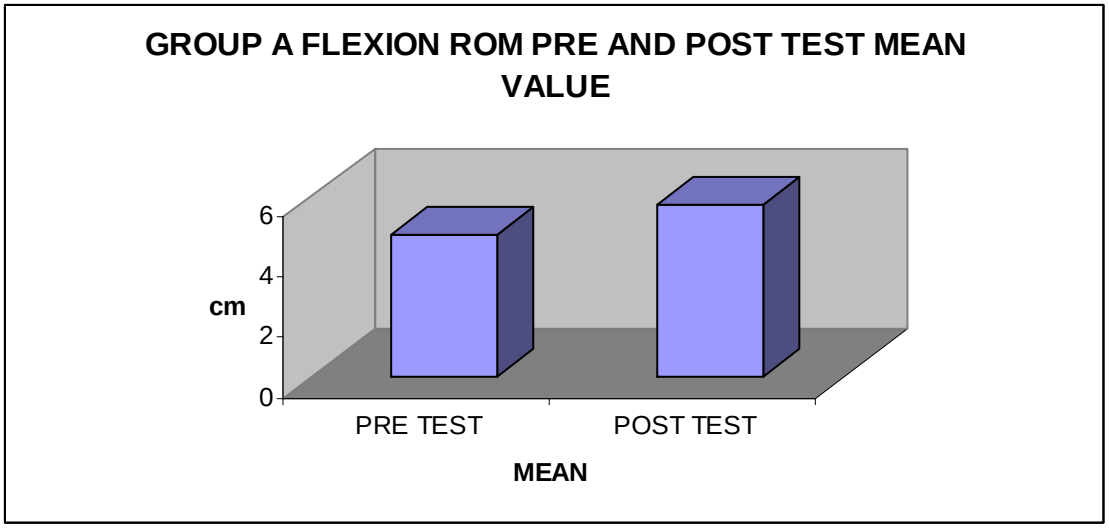


Table: 10

MEAN AND MEAN DIFFERENCE OF PRE TEST AND POST TEST VALUE OF GROUP A EXTENSION USING RANGE OF MOTION (ROM)

S.NO	GROUP A	Improvement		Standard Deviation	Paired 't' value
		Mean	Mean Difference		
1.	Pretest	8.51	3.18	0.39	4.84
2.	Posttest	5.33			

Fig: 4

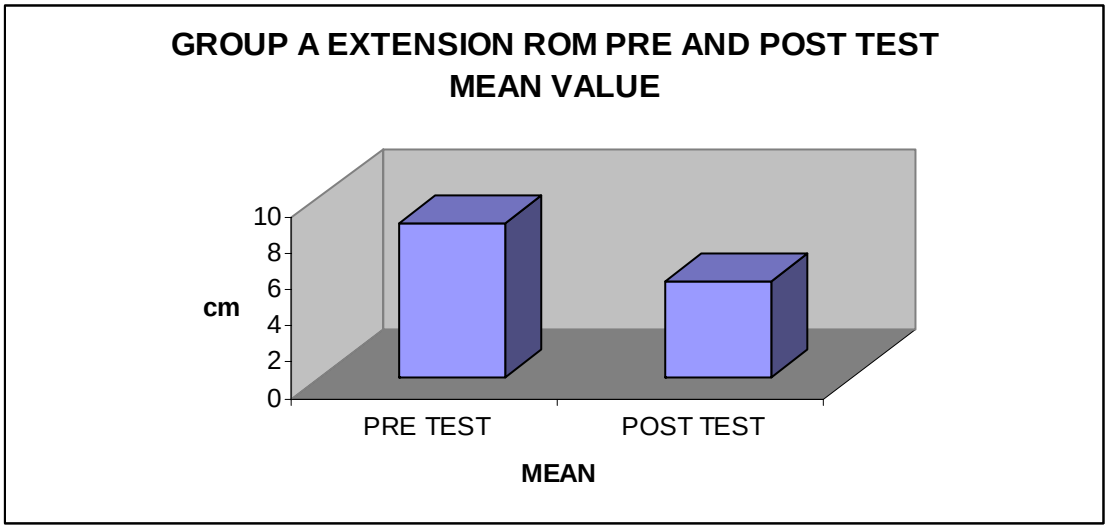


Table: 11

MEAN AND MEAN DIFFERENCE OF PRE TEST AND POST TEST VALUES OF GROUP B EXTENSION USING RANGE OF MOTION (ROM)

S.NO	GROUP B	Improvement		Standard Deviation	Paired 't' value
		Mean	Mean Difference		
1.	Pretest	8.51	3.26	0.46	3.43
2.	Posttest	5.25			

Fig: 5

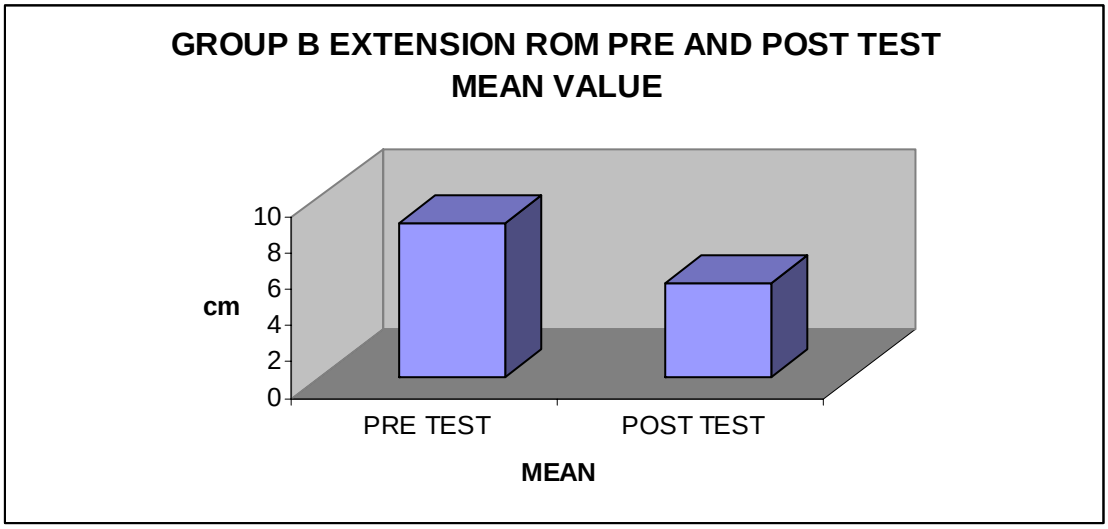
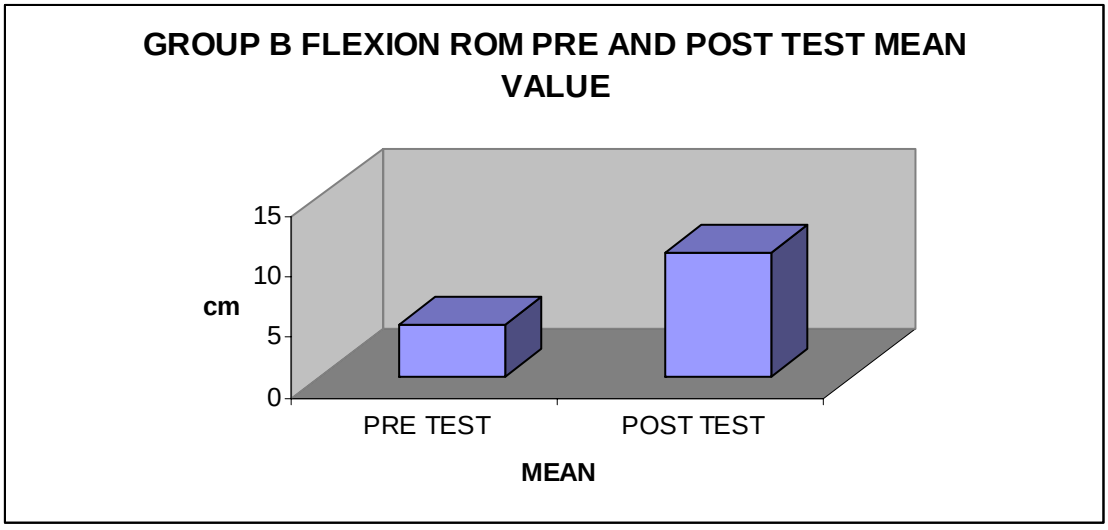


Table: 12

MEAN AND MEAN DIFFERENCE OF PRE TEST AND POST TEST VALUES OF GROUP B FLEXION USING RANGE OF MOTION (ROM)

S.NO	GROUP B	Improvement		Standard Deviation	Paired 't' value
		Mean	Mean Difference		
1.	Pretest	4.39	5.98	0.49	4.90
2.	Posttest	10.37			

Fig: 6

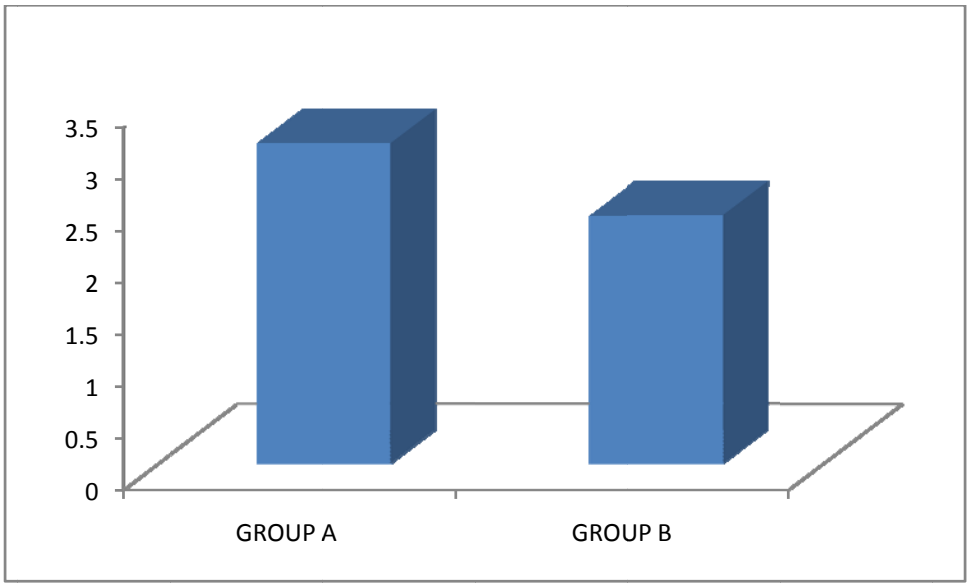


BOTH GROUP VALUES OF PAIN USING VAS

Table: 13

S.NO	ROM	Improvement		
		Mean Difference	Standard deviation	Un paired 't' Value
1.	Group A	3	0.353	7.32
2.	Group B	2		

Fig: 7

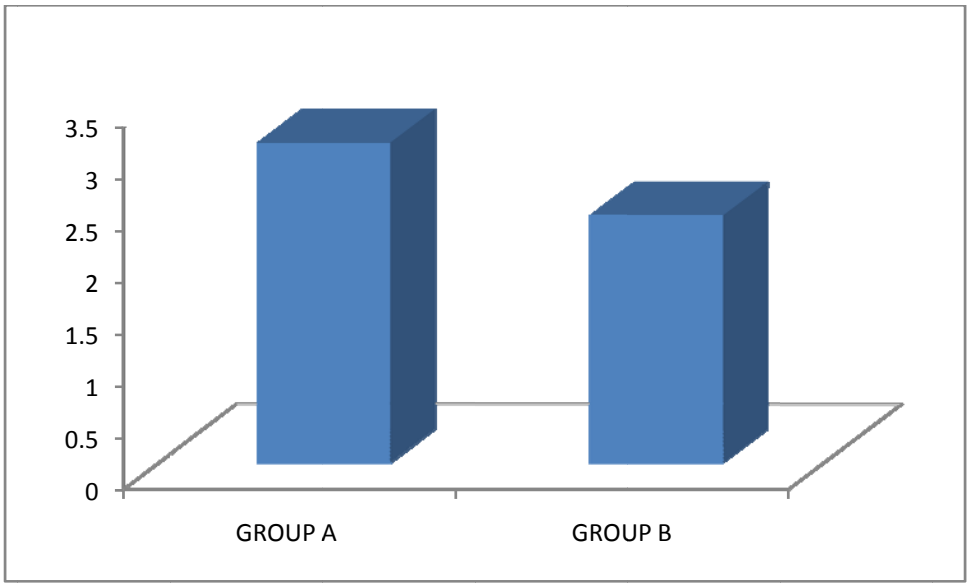


BOTH GROUP VALUES OF FLEXION RANGE OF MOTION

Table: 14

S.NO	ROM	Improvement		
		Mean Difference	Standard deviation	Un paired 't' Value
1.	Group A	4.1	2.56	7.32
2.	Group B	3.2		

Fig:8

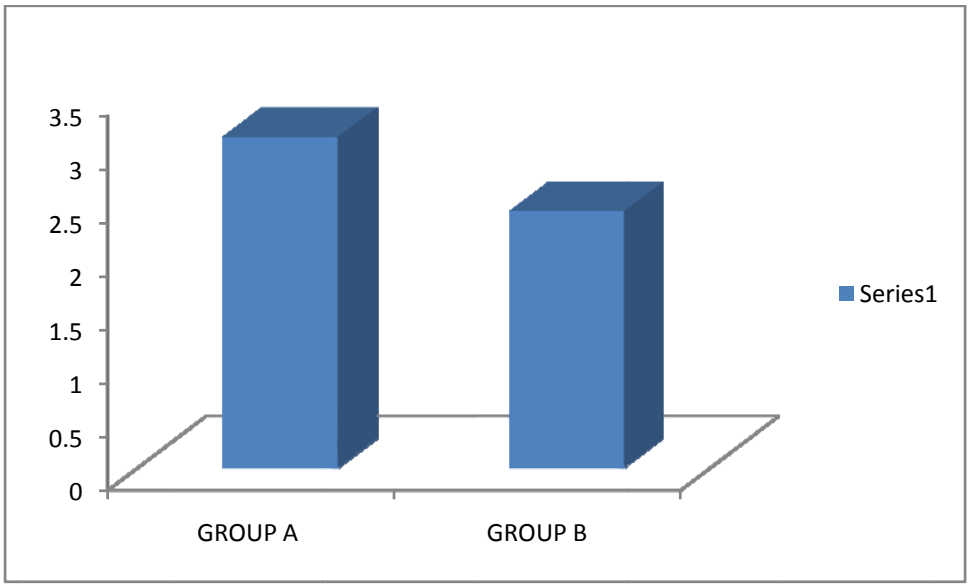


BOTH GROUP VALUES OF EXTENSION RANGE OF MOTION

Table: 15

S.NO	ROM	Improvement		
		Mean Difference	Standard deviation	Un paired 't' Value
1.	Group A	3.1	1.23	3.12
2.	Group B	2.4		

Fig:9



4.2 RESULTS

Group A pre test and post test values of pain scores were analyzed by Paired ‘t’ test. The calculated value is 9.50 , whereas the critical value is 2.145 at 0.005 level. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Group A.

Group B pre test and post test values of pain scores are analyzed by Paired ‘t’ test. The calculated value is 8.24 , whereas the critical value is 2.145 at 0.005 level. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Group B.

When comparing both the groups values of pain by unpaired’ test, the calculated t value is 7.32 and ‘t’ table value is 3.92 at 0.005 level. Since the calculated ‘t’ value is more than ‘t’ table value, it is concluded that there is significant difference among lumbar stabilization exercises and general spinal exercises in lumbar disc prolapsed subjects. Hence the alternate hypothesis is accepted and null hypothesis is rejected.

Group A pre test and post test values of lumbar flexion scores were analyzed by Paired ‘t’ test. The calculated value is 5.44, whereas the critical value is 2.145 at 0.005 level. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Group A.

Group B pre test and post test values of lumbar flexion scores were analyzed by Paired ‘t’ test. The calculated value is 4.90, whereas the critical value is 2.145 at 0.005 level. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Group B.

When comparing both group values of flexion range by unpaired ‘t’ test the calculated t value is 7.32 and ‘t’ table value is 2.101 at 0.005 level. Here since the calculated ‘t’ value is more than ‘t’ table value, it is concluded that there is significant difference among lumbar stabilization exercises and general spinal exercises in lumbar disc prolapsed subjects. Hence the alternate hypothesis is accepted and null hypothesis is rejected.

Group A pre test and post test values of lumbar extension scores were analyzed by Paired‘t’ test, the calculated value is 4.84, whereas the critical value is 2.145 at 0.005 level. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Group A.

Group B pre test and post test values of lumbar extension scores were analyzed by Paired ‘t’ test, the calculated value is 3.43, whereas the critical value is 2.145 at 0.005 level. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Group B.

When comparing both group values of extension range by unpaired ‘t’ test the calculated t value is 3.12 and ‘t’ table value is 2.101 at 0.005 level. Here since the calculated ‘t’ value is more than ‘t’ table value, it is concluded that there is significant difference among lumbar stabilization

exercises and general spinal exercises in lumbar disc prolapsed subjects. Hence the alternate hypothesis is accepted and null hypothesis is rejected

V.DISCUSSION

The study result shows that lumbar stabilization exercises and general spinal exercises both reduces pain and improve range of motion of spine significantly among prolapsed lumbar disc subjects, but when comparing lumbar stabilization exercises and general spinal exercises, lumbar stabilization exercises reduces pain and improve range of motion significantly than general spinal exercises lumbar disc prolapsed subjects there is among

Koumontakas GA, Watson P J. (2005) concluded that that the trunk muscle stabilization training plus general exercises will improve the range of motion of spine and reduces pain among prolapsed lumbar disc subjects.

The present study supports Koumontakas GA, Watson P J study. Lumbar spinal exercise protocols specifically focus on lumbar spinal muscles that are actively engaged in exercise. These exercises relieve pain, improve functional parameters and strengthen trunk and back extensors. General spinal exercise is mainly flexibility exercises and study showed that benefits of these are not better. These old fashioned exercise do not have potential to actively engage lumbar spinal muscles so these are able to control spine in different postures. Except when patient is in acute condition, these exercises are perfectly safe, comfortable and easy to learn for all

patients. This finding was consistent with all participants in experimental group. Safety and efficacy has demonstrated in patient with low back pain including those with nerve root compression. These exercises do not have any contraindications and can readily be included in any therapeutic exercise program. However, at the end of the study, many patients fell bored when told to exercise. Although they took these exercises very lightly, nonetheless, their progress was satisfactory. This proves therapeutic efficacy and potential of stabilization exercises to activate the core stability effects. Besides therapeutic efficacy of Lumbar stabilization exercise, it is also very mandatory for all working therapist to be fluent and accurate with their techniques in such patients, as these were found to provide excellent results. Regarding management of such patients, role of modalities and manipulative management needs to be clinically established. Clinical trials can be conducted in discogenic patients to compare their post exercise pain disability score in pool and at home utilizing LSE protocols.

VI.CONCLUSION

The study was conducted with the aim to compare the effectiveness of Lumbar stabilization exercise and general spinal exercise on patients with Lumbar disc prolapse. Participation between the age group of 30-40 years were selected and divided into two groups, one Group receiving Lumbar stabilization exercise and other Group receiving General spinal exercise. Based on the statistical analysis, both the groups relieve pain and increases lumbar flexion and extension range of motion but the Lumbar stabilization exercise is significantly more effective than General spinal exercise in categories such as pain relief and lumbar range of motion. Hence, we concluded that Lumbar stabilization exercise is effective in relieving pain and increases lumbar flexion and extension range of motion.

6.1 LIMITATIONS

1. The study was done in a very small sample size.
2. The study was conducted only for disc prolapse patients.
3. The study was conducted only for mechanically disc prolapse.
4. The duration of the study was short.
5. The study was done only for patients between age group of 30 to 40 years.

6.2 SUGGESTIONS

1. Similar study can be carried out for larger sample size.
2. Study can also be conducted for sub acute and chronic low back patients.
3. Study can be carried out for longer period of duration.
4. Study can also be carried out for different age group of patients.

5. A control group can be added for better results.

VII. BIBLIOGRAPHY

1. Kisner C, Colby LA. Therapeutic exercises. 5th ed. New Delhi: Jaypee;2007.p.13.

2. Adams MA, May S, Freeman BJ, Morrison Hp, Dolan P. Effects of backward bending on lumbar intervertebral discs. Relevance to physical therapy treatments for low back pain. Spine1999;24:431-7.

3. Adams MA, Monnion AF, Dolan P. Personal risk factors for first-time low back pain. Spine 1999;3:2497-505.

4. Hopper C, Kolt GS, McConville JC. The effects of Feldenkrais awareness through movement on hamstring length, flexibility, and perceived exertion. J Bodywork Movement Therapies 1999;3:238-47.

5. Liebenson C. Spinal stabilization training. J Bodywork Movement Ther 1998;2:218-23.

6. Hides J, Jull GA, Richardson CA. Long term effects of specific stabilizing exercises for first episode low back pain. Spine 2001;26:E243-8.

7. McGill SM. Low back stability: from formal description to issues for performance and rehabilitation. Exer Sport Sci Rev 2001;29:26-31.

8. Hyoung HK. Effects of a strengthening program for lower back in older women with chronic low back pain. J Korean Acad Nurs 2008;38:902-13.

9. Grenier SG, McGill SM. Quantification of lumbar stability by using 2 different abdominal activation strategies: Arch Physical Med Rehabil 2007;88:54-62.

10. Akuthota V, Nadler SF. Core strengthening: Arch Physical Med Rehabil 2004;85:3Suppl 1:S86-92.

11. Kiesel KB, Underwood FB, Mattacola CG, Nitz AJ, Malone TR. A comparison of select trunk muscle thickness change between subjects with low back pain classified in the treatment-based classification system and asymptomatic controls. J Orthp Sports Phys Ther 2007;37:596-607.

VII. ANNEXURE

ANNEXURE:1

Subjective assessment

Name

Age

Sex

Occupation

Date of admission

Chief complaints

History

Persent medical history

Past medical history

Personal history

Family history

Social history

Vital signs

BP

Temperature

Pulse rate

Respiratory rate

Pain assessment

Onset

Duration

Side

Site

Type

Character

Aggravating factor

Relieving factor

Nature

VAS Scale

24 Hrs Patter

Objective Assessment:

On observation:

Body built

Posture (anterior,posterior, Lateral view)

Attitude of Limbs

Breathing pattern

Deformity

External appliances

Skin colour

Abnormal bony contours

Oedema

Muscle wasting

Gait

On palpation

Warmth

Tenderness

Spasm

Tone

Nodules

Crepitus

Oedema

Capillary filling

Pulses

On examination

Sensory

Superficial sensation

Deep sensations

Cortical sensations

Reflexes

Motor

Chest expansion

Upper Limb

ROM	RT	LT

Lower Limb

PROM	RT	LT

Upper limb

Lower limb

Muscle Power

End Feel

Muscle Girth

Limb Length

Gait

Special test

Functional Activities

Investigation

Provisional Diagnosis

Problem List

Short Term Goal

Long Term Goal

Follow-UP

Home Advice

ANNEXURE – II

CONSENT FORM

I have been informed about the procedure and the purpose of the study. I have understood that I have the right to refuse my consent or withdraw it any time during the study without adversely affecting the study. I am aware that being subjected to this study, I will have to give sometime to this study and this assessment do not interfere with the benefits.

I _____ , the undersigned give my consent to be a participant of the study program.

Signature of the consent

(Name and Address)